REMARKS

Reconsideration of this application, as amended, is respectfully requested.

Claims 1-62 are pending. Claims 1-62 are rejected. Claims 1, 3-5, 7,11,14,18, 21, 24, 27, 30, 33, 37, 38, 40, 43-46, 48, 49, 51, 55 have been amended. Claims 9, 13, 16,17, 19, 23, 26, 29, 32, 35, 36, 39, 42, 47, 50, 53, 54, 57 have been cancelled.

Support for the amendments is found in the specification, the drawings, and in the claims as originally filed. Applicants submit that the amendments do not add new matter.

Rejections Under 35 U.S.C. § 112

The Examiner has rejected claims 3-5 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention.

The Examiner rejected claims 3-5 for failing to provide proper antecedent basis. Applicants have amended claims 3-5 and respectfully submit that amended claims 3-5 comply with §112, second paragraph, and therefore request withdrawal of this rejection.

The Examiner has also rejected claims 42, 44, 46-47 and 49-50 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. The Examiner stated that these claims depend upon the wrong set of claims, and therefore the limitations lack antecedent basis.

Applicants amended claims 44, 46, and 49 and canceled claims 42, 47, and 50. Applicants respectfully submit that amended claims 44, 46, 49 comply with §112, second paragraph, and therefore request withdrawal of this rejection.

Rejections Under 35 U.S.C. § 103(a)

Claims 1-62 are rejected under 35 U.S.C. §103 as being unpatentable over "Distinguishing Photographs and Graphics on the World Wide Web", by Athitsos (hereinafter "Athitsos"), IEEE 1997, in view of U.S. Patent No. 5,491,627 of Zhang, et al. (hereinafter "Zhang"). The Applicants respectfully traverse this rejection for the reasons set forth below.

Athitsos discloses an automated system that distinguishes photographs and graphics on the World Wide Web. Recognition tests are originated from the statistical observations about the differences between computer-generated graphics and photographs that appear on the Web.

Based on these observations, Athitsos creates image metrics, which are functions based on images. The image metrics are expressed in terms of real numbers, "metric scores". In order to achieve high recognition accuracy, Athitsos combines scores from several metrics. Further, the system uses learning to create decision trees, which specify how to combine the various metric scores of an image to classify it (Athitsos, page 11, col.1, lines 2-9, lines 13-19). Athitsos observes that graphics tend to have fewer colors than photographs. The score of the image for the prevalent color metric is the fraction of pixels that have that color. Photographs contain noise that causes even nearby pixels to have different colors (RGB values) (Athitsos, page 11, col. 2, lines 4-8) resulting to the lower color metric score for photographs in comparison to graphics. However, Athitsos does not teach or suggest using the noise itself as a metric to distinguish between photographs and graphics, as recited in amended claim 1 given below:

> A method to train image classification, comprising:
> measuring noise in a first image; and
> training a classification model from a noise to classify a second image as a natural image versus an artificial image from the noise.

(Amended claim 1) (Emphasis added)

The Examiner admitted that Athitsos fails to disclose training the classification model using the noise. However, the Examiner suggested that Zhang teaches training the model using the noise. Applicants respectfully disagree. Zhang discloses a method and system for the detection of microcalcifications in digital mammograms. First, regions-of-interest (ROIs) are selected from digital mammograms using a well-known computer-aided diagnosis device (CAD). Then the ROIs are background trend corrected, optionally Fourier transformed into the frequency domain, and then scaled for input into a neural network trained to detect microcalcifications.

However, contrary to the Examiner's assertion, in the portion of the reference cited by the Examiner (col. 5, lines 9-20), Zhang refers to a well-known CAD device for initial selection of ROI from digital mammogram. This device, described in detail in U.S. Patent No. 4,907,156 by Doi et al (hereafter "Doi"), processes digital X-ray image to obtain signal-enhanced image data with a maximum signal-to-noise ratio and signal-suppressed image data with a suppressed signal-to-noise ratio. Then, it forms difference image by subtraction of the signal-suppressed image from the signal-enhanced image to merely remove anatomic structured background and to enhance the visibility of regions-of-interest. This difference image is input to a feature extraction device that merely extracts the features characterizing abnormal anatomic regions, such as circularity, and size, and does not extract a noise, as a feature, to select ROIs (Doi, col.3, lines 33-35). Since Zhang merely utilizes CAD device for initial selection of the ROIs, Zhang does not disclose training the model using noise to classify a second image as a natural image versus an artificial image from the noise, as recited in amended claim 1.

Thus, Zhang does not teach or suggest training a classification model from a noise as recited in amended claim 1. Consequently, Zhang lacks the same features of claim 1 that are missing from Athitsos.

Therefore, Athitsos and Zhang, taken alone or in combination, do not teach or suggest the present invention as claimed in claim 1.

In addition, there is no motivation to combine Athitsos and Zhang, because they do not teach, mention, nor disclose training a classification model from noise. There is no teaching or suggestion that training a classification model from noise is present either in Athitsos or Zhang. Moreover, neither of them suggests desirability of training a classification model from noise, as recited in claim 1. Therefore, one skilled in the art would not look to combine Athitsos and Zhang to solve the same problem overcome by the present invention.

In view of the above, Applicants respectfully submit that claim 1 is not obvious under 35 U.S.C. § 103(a) over Athitsos in view of Zhang.

Claims 2-6 depend on claim 1 and include features that further limit claim 1. Thus, Applicants respectfully submit that for at least the same reasons as claim 1, dependent claims 2-6 are not obvious under 35 U.S.C. § 103(a) over Athitsos in view of Zhang.

With respect to claim 7, as discussed above, Athitsos' method distinguishes photographs from graphics by using a number of metrics. Zhang uses features to select the ROIs on the X-ray images.

However, as discussed above, Athitsos and Zhang, taken alone or in combination, do not teach, mention, or suggest distinguishing a slide image from a comic image by generating the feature vector that comprises at least one feature of an image selected from the group consisting

of at least one text block feature of the image, at least one edge feature of the image, and at least one aspect ratio of the image.

Thus, Applicants respectfully submit that claim 7 is not obvious under 35 U.S.C. §103(a) over Athitsos in view of Zhang.

Claims 8 and 10 depend on claim 7 and include features that further limit claim 7. Therefore, Applicants respectfully submit that for at least the same reason as claim 7, claims 8 and 10 are not obvious under 35 U.S.C. § 103(a) over Athitsos in view of Zhang.

Amended independent claims 11, 24, 30, 37, 40, 48, and 55 and their corresponding dependent claims 10, 12, 25, 31, 38, 41, 49, 56 include language that is similar to the language of amended claim 7, namely that the feature vector comprises at least one feature of an image selected from the group consisting of at least one text block feature of the image, at least one edge feature of the image, and at least one aspect ratio of the image, and that the feature vector is used to distinguish a slide image from a comic image.

Thus, Applicants respectfully submit that claims 11, 24, 30, 37, 40, 48, and 55 and their correspondent dependent claims 12, 25, 31, 38, 41, 49, and 56, for at least the same reason as claim 7, are not obvious under 35 U.S.C. §103(a) over Athitsos in view of Zhang.

With respect to claim 14, Athitsos merely discloses above-mentioned metrics to distinguish between photographs and graphics. Zhang's microcalcification detection system discloses shift-invariant neural network to detect microcalcifications using described above CAD device to select ROIs. In presently claimed invention, in contrast, a feature noise vector for a classification model is derived from the noise difference histogram. Such feature vectors as a noise vector and/or sharpness vector are used to classify the image as natural or computer-generated.

As neither Athitsos nor Zhang discloses creating a feature vector that includes one or more of a noise vector and a sharpness vector, as recited in amended independent claim 14, to distinguish a natural image from an artificial image, Applicants respectfully submit that claim14 is not obvious under 35 U.S.C. § 103(a) over Athitsos in view of Zhang.

Claim 15 depends on claim 14 and includes features that further limit claim 14. Therefore, Applicants respectfully submit that claim 15 is not obvious under 35 U.S.C. § 103(a) over Athitsos in view of Zhang.

Amended independent claims 21, 27, 33, 43, 45, 51, 58 and their corresponding dependent claims 22, 28, 34, 44, 46, 52, 59-62 include the language that is similar to the language of claim 14. Specifically, these claims set forth generating a feature vector that includes one or more of a noise vector and a sharpness vector to distinguish a natural image from an artificial image.

Thus, Applicants respectfully submit, that claims 21, 27, 33, 43, 45, 51, 58 and their dependent claims 22, 28, 34, 44, 46, 52, 59-62, respectively, for at least the same reasons as claim 14, are not obvious under 35 U.S.C. § 103(a) over Athitsos in view of Zhang.

With respect to claim 18, Athitsos merely discloses a method to distinguish between static photographs and graphics. Unlike presently claimed invention, Athitsos' method does not disclose images that are frames in a video stream. The Examiner stated that Zhang teaches the video stream of data and referred to a mammogram as a video signal. Applicants respectfully disagree. Mammogram is a static image of the object, whereas a frame in a video stream, as recited in amended claim 18, is part of a dynamic image. Thus, none of the above-mentioned references, taken alone or in combination, teaches or suggests the image classification system, wherein the image is a frame in a video stream, as recited in claim18. Hence, Applicants

respectfully submit that claim 18 is not obvious under 35 U.S.C. § 103(a) over Athitsos in view of Zhang.

Claim 20 depends on claim 18 and further limits claim 18. Therefore, Applicants respectfully submit, that claim 20, for at least the same reasons, as claim 18, is not obvious under 35 U.S.C. § 103(a) over Athitsos in view of Zhang.

In conclusion, applicants respectfully submit that in view of the arguments and amendments set forth herein, the applicable rejections have been overcome. If the Examiner believes a telephone interview would expedite the prosecution of this application, the Examiner is invited to contact Michael Mallie at (408) 720-8300. If there are any additional charges, please charge our Deposit Account No. 02-2666.

Respectfully submitted,

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